

DOCUMENT RESUME

ED 143 717

UD 017 194

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TITLE A Systems Approach to an Applied Research Design for a Basic Skills Curriculum in Learning and Reading in Urban Schools.
PUB DATE 7 Apr 77
NOTE 46p.; Paper presented at the American Educational Research Association (New York, N.Y., April 7, 1977); Best copy available
EDRS PRICE MF-\$0.83 HC-\$2.06 Plus Postage.
DESCRIPTORS *Basic Skills; *Curriculum Design; Curriculum Development; Elementary Secondary Education; Learning Processes; Low Income Groups; *Mastery Learning; *Models; Program Descriptions; *Research Methodology; Systems Analysis; *Systems Approach; Urban Schools
IDENTIFIERS *New Jersey (Newark)

ABSTRACT

This is a position paper which deals with learning and reading difficulties of students in urban schools. The program upon which this paper is based is a learning and reading readiness classroom system that uses the Informational Process Model. This system acts as the basic construct for matching learners' needs based on the assessment data, with the therapeutic materials organized around educational strategies which are based on the best current synthesized knowledge available on how children learn. A major purpose of the paper is to demonstrate and support by empirical data, that urban schools, as presently organized and administered, contribute to urban students' failure process. The setting for this project was within the largest urban school district in New Jersey. The community consisted of low socioeconomic groups of blacks, Puerto Ricans and working class whites. The students involved in all six schools were taken from kindergarten through second grade, with one more grade level (3rd) added in the last year of the program. This 6 year longitudinal study involved over 900 students. Large bodies of observational data and qualitative check lists were used by staff. The collected data indicated that the project was successful as significant changes occurred in the performance of participating pupils. (Author/AM)

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A SYSTEMS APPROACH TO AN
APPLIED RESEARCH DESIGN
FOR A
BASIC SKILLS CURRICULUM
IN
LEARNING AND READING
IN
URBAN SCHOOLS

Paper Presented at
The American Education
Research Association
April 7, 1977
New York City

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INTRODUCTION: RESEARCH "IN SCHOOLS" RATHER THAN "ON SCHOOLS"

This is a position paper that deals with the endemic learning and reading difficulties of students in urban schools. The arguments to be presented in defense of the positions taken in this paper are based on six years of applied research "in" a large urban school district in New Jersey.

A major purpose of this paper is to demonstrate and support, by empirical data, that urban schools, as presently organized and administered, unwittingly contribute to the urban students' failure process. Further, I will argue that the major research findings of Coleman, Jencks and Jensen, that "schools do not make a difference because of the family and out-of-school variables", is not only faulty but reinforces a negative valence, which galvanizes urban school administrators, teachers and other staff specialists to the position "That schools cannot be held accountable for the failure of urban students."¹²⁰ Most schoolmen implicitly believe these facts to be true and act accordingly. They also conclude, as do Coleman and Jencks, that "it's not the models of education or the curriculum that is faulty, it's the out-of-school variables that are the cause of the failure process, i.e., family, economic status, heredity, etc."¹²⁰ Schoolmen at all levels argue that they have limited control over other major input variables such as: location and size of school plant, size of classroom (teacher-pupil ratio), availability of special facilities and equipment, staff composition (age, sex, race, experience, etc. and financial resources).

One educational researcher in a paper presented at an annual conference of the Florida Research Association in Orlando, presented a very current and popular point of view on why schools cannot be held accountable. He said:

"In fact, that if all the variables (as mentioned above) were taken into account over which the school has no control, schools could probably end up accounting for as little as 5% of the difference between achievement outcomes of students within any given group. Thus, on the average, if the same group of students were educated in the "best" school in the district, their academic achievement would be but 5% better than it would have been had they been educated in the "worst" school in the district--if all other variables affecting academic achievement, over which the schools have no influence were held constant."²

This statement defines the problem that our research attempted to investigate--how to shift schools away from the present measurement of pupil results, based on the achievement model, and to organize, within a systems model, a curriculum based on students' diagnostic needs and to demonstrate how "the in-school variables" can be controlled. How an empirically structured curriculum can be designed so that the majority of students will learn the critical basic skills that are overlooked and poorly taught by the traditional curriculum model.

²David Berliner, "Progress and Problems in the Study of Teacher Effectiveness: A Review and Confrontation" paper presented at the Annual Conference Florida Research Association, January 27, 1976, Orlando, Florida.

THE CURRENT PROBLEM

Based on the findings and analysis from our research there are critical problems in urban education which demand much more attention than they presently command when analyses are offered for the causes that undergird the endemic learning and reading failure found among urban students.

These are:

- . The mismatch between the traditional curriculum model and the urban student's basic skills needs;
- . Teacher instructional strategies which unwittingly reinforce failure in urban classrooms;
- . The achievement model of schooling and its effect on curriculum design;
- . The resistance to change induced by the informal social organization of the school and the politics of education.

1) The Traditional Curriculum Model:

The established institutionalized curriculum policy that is now historically embedded in urban school districts in the United States is a major deterrent to the teaching of basic skills. Curriculum formats are more concerned with, and put more emphasis on what the teacher is to teach and less on what the child is to learn. Learning outcomes are not spelled out in traditional curricula. The primary direction here is what is arranged for the student to do. Essentially, the difference is one between the artistic vs. the empirical-heuristic approach to teaching. Those who take the artistic approach tend to think of curriculum as having clear beginnings and endings and think of evaluation mainly in the achievement sense. Those who write traditional curricula are not held accountable for the implementation of the curriculum as written. Neither party ever really knows why children succeed or fail in current traditional curriculum

designs. In addition, current traditional curriculum outcomes only serve as ad-hoc judgment on what has been done.

2) Teacher Instructional Behaviors

Linked with the problems inherent in the traditional curriculum model described above are certain critical teaching behaviors and teacher strategies which unwittingly reinforce the failure of urban students. These teaching behaviors are not engaged in by teachers in any malicious or deliberate way. The teaching behaviors described below are the results of the way teachers are trained in the teachers colleges and universities, not the results of some pernicious individual behavior pattern.

2a) Teaching by Telling: Teachers in traditional elementary and secondary classrooms, starting at kindergarten and every grade thereafter, lecture their pupils as if they were in a college classroom. The lecture method-- "teaching by telling model" is a pervasive cause of the skills failure of urban pupils. The system is teacher centered, not child centered.

2b) There is little or no sequential-diagnostic prescriptive assessment of individual pupils' needs. There is no profile of these basic skills, organized as a permanent record for each student, that would follow him from grade to grade.

2c) The "little red school house" syndrome prevails in all public schools. Each teacher pursues her teaching of the fixed traditional curriculum as she evaluates it and perceives it. In urban schools, this is a disaster.

2d) Reading instruction, as pursued by more than eight out of ten elementary school teachers in urban centers, is based on an instructional model designed by book publishers. Teachers have been very poorly trained in the theory of reading, in the diagnostic prescriptive approach to reading, and in systematizing individual reading programs. Why? They were never taught at the college level and large urban school

districts have no organized way of helping them learn. What is more--traditional reading curricula are not, conservatively speaking, more than ten years behind the reading research and the improved ways for teaching reading, based on this research.

These are the most critical teacher behaviors we have observed from our research. There are other teacher behaviors which are also very important and some that still have not been analysed and require further research in the classroom. There are also some very critical behaviors on the part of administrators which affect the present use of traditional curricula and the classroom learning environments which are reviewed in our final research report but will not be covered here.

3) The Achievement Model of Schooling and its Effect on the Traditional Curriculum Process

Fourteen years ago, John B. Carroll, then at the Harvard School of Education, developed a conceptual model of school learning which is almost entirely overlooked by urban school administrators. There are many aspects of the current educational dilemma, found in urban school districts which are clearly explained by Carroll's analysis and are so ably argued by him. This is a key concept in the instructional model developed in our applied research.

"If we are to change and improve schooling, especially as a means of intervention for children with educational problems, in poverty pockets and in urban school environments, it is essential that the model itself change." He argues, "that the traditional model rests on observation, almost always ignored by those who administer schools; that individual pupil achievement is the basic measure of the traditional school and where the school is committed to uniform exposure to instruction, it is inevitable that pupils with higher abilities will achieve more in the same amount of

time; and when all the achievement test scores are gathered together, the distribution will approach that of a normal curve."¹⁰⁰

"It is important that this relationship be clearly understood. If instructional time is held constant for all pupils, the outcomes are fixed; that is, the faster learners with the most highly developed skills will learn more than the slower learners during the same amount of instructional time and, consequently, the faster learners will achieve more and do better on achievement tests. It seems very unlikely that any foreseeable educational intervention or innovation will change this outcome in any substantial way, as long as the instructional time is held constant."¹⁰⁰

What Carroll proposed instead was that "our measures" should be that of mastery learning and that the "type of instruction" and the "time" for it should be varied according to individual pupil characteristics. The outcome then would hopefully be that a majority of students would achieve a specific level of mastery; that there would be little or no correlation between aptitude and mastery measures; but time to mastery would still correlate with aptitude scores."⁹⁸

Our present traditional curricula and schools policies, however, are almost universally organized to give group instruction based on a uniform time schedule. "This is an efficient way to run a large organization, but its very convenience in dealing with large numbers of pupils leads inevitably to the measurement of individual pupil achievement under conditions of standard exposure to instruction."¹⁰⁰

From the standpoint of urban education it is critical that this relationship between measurement of educational outcomes and the organization of the school be kept in mind. "No matter what ideal system of schooling is invented, if it relies upon 'standard time for instruction' it seems inevitable that the outcome measure is going to be

pupil achievement distributed along a normal curve which will be positively correlated with the pupils' rate of learning as measured on some aptitude test. As long as the "instructional time" is held constant for all pupils, individual differences will increase and will be related to the pupil's score on ability tests of basic skills and cognitive processes which predict rates of learning."-100

4) The Informal Social Organization and Politics of Education

Operating within the framework and daily application of the traditional curriculum model are several critical informal social organizational and political variables which interfere with the change process that is required to successfully implement and integrate a basic skills curriculum in reading and arithmetic in urban schools. These are: resistance to increased work effort by the staff caused by a change to a diagnostic-prescriptive achievement educational model. The traditional curriculum models are much easier to administer than the diagnostic-prescriptive-time to mastery reading curriculum. Administrators resist change in order to control conflict that would arise in any attempt to shift the curriculum model from its traditional process to an empirically based one. The teachers' resistance to change and the mythical-like fear of the accountability model, inherent in the systems approach to education. There is also a strong, a priori value position taken by many teachers which states that curricula that are basic skills oriented are somehow anti-humanistic, they do not teach creativity and are in some way sinister and should be resisted.

All these more subtle informal social organizational and political behaviors engaged in by all levels of the educational bureaucracy, from the classroom teacher to the Superintendent, dramatically interfere with the implementation of systematic basic skills curricula in urban schools.

THE PURPOSE OF THE RESEARCH: TO DESIGN AN EMPIRICAL APPROACH TO CURRICULUM DESIGN

The empirical approach emphasizes the importance of documenting instructional issues with data and examining them empirically. Such an approach leads logically to domain reference--diagnostic prescriptive teaching and testing and to organizational strategies which emphasize a systematic model based on experimentation and revision. We, who support the empirical approach to curriculum design, argue that curriculum development is an open-ended process of continual trial and improvement and emphasizes formative evaluation. From the empirical viewpoint, an ideal curriculum should give unequivocal direction as to how to make certain things happen in a classroom, given that those things are known from experimentation to lead to specified learning outcomes. The curriculum, in these terms, turns out to be a report of procedures that have actually been tried out. This implies close initial cooperation between writers and teachers in a laboratory-classroom setting. Separation of the two processes creates a barrier to tryouts and evaluation of content and method, as well as learner outcomes. As we have pointed out previously, when curriculum writers are not held accountable for the learning outcomes and teachers are not held very strictly accountable for the learning outcomes and teachers are not held accountable for the implementation of the curriculum as written, neither party ever really knows why children succeed or fail in current traditional curriculum designs. Current traditional curriculum outcomes only serve as an ad-hoc judgment on what has been done. What the empirical curriculum demands is a formative evaluation which is central and dynamic rather than peripheral and static.

Basic and implicit to the empirical-heuristic curriculum model is the mastery model proposed by John Carroll. In this model, schools are organized so that each

student spends different amounts of time to reach each mastery level, based on his own rate. We, who support this approach, argue for a different model of evaluation--one based upon mastery in specified units. A mastery model of evaluation will require:

- . Specific educational objectives based on pupil's diagnosed needs
- . Various specified routes or strategies to assure that the majority of pupils attain the criteria set for mastery
- . Specified sequence
- . Specified measures of competency

If we design the learning systems and learning environments correctly, in time, a mastery model of evaluation should permit for more individualization of the routes to mastery, based on learners' basic skills needs, learning styles and characteristics and specific interest and values.

Most importantly, this educational model would require that all curricula would have to undergo a logical analysis and evaluation, which is now sadly lacking. The traditional model of curriculum, as now used, fails to meet the diagnostic educational needs of more than sixty per cent of the pupils in urban schools.

The next section of this paper will describe and explain the curriculum design that undergirds the Title III/Right to Read Program.

PROCESS MODEL : A BASIC SKILLS PROGRAM USING A SYSTEMS DESIGN AND APPLIED MODEL

The History and Source of Funds

This research was funded by a series of U. S. Office of Educational Grants starting in the Fall of 1969. The initial funding was a Title VI Grant, 1969 to 1971. The next funding which expanded the Project from one school to four schools was obtained in the Fall of 1971 and ran to June 1974. In September 1972 the Right to Read Office made a grant which expanded the model to two more schools with a much larger population. The Right to Read Grant ran from September 1972 to June 1974. The above grants were also coupled with Title I funds, which provided all the para-professional personnel from September 1969 to June 1974. The Board of Education also provided extra funding for all additional teachers and staff used in the process as described.

The Population

The setting for this Project is within the largest urban school district in New Jersey. The community consists of low socio-economic groups of Blacks, Puerto Ricans and working class Caucasians, mostly of Italian heritage. The city has been in a severe state of social, economic and political change. However, the situation is now showing definite signs of a reversal process through urban renewal and political direction, which are more positive and goal directed.

The students involved in all six schools in this research were students in Kindergarten through second grade, with one more grade level (3rd) added in the last year of the Right to Read Program. The study is longitudinal and involved over 990 students over a six-year period.

Theoretical Framework:

There are some critical concepts which undergird the applied research model that must be explained, if the strategies used in the Program are to be understood. The major concepts and constructs which form the structure of our management and delivery system are these:

Applied Systems Science⁹⁹

Applied systems science deals with the study of "organized complexities." The educational process in urban school systems is just such a complexity. It is critical that we learn to utilize data and information for unlocking such complexities.

A System is Defined

- .As the totality of elements in interaction with each other.
- .As a type of structure which functions in the form of definite sequences of operations
- .As the structure or organization of an orderly whole clearly showing the interrelations of the parts to each other and to the whole itself.

The essence of these definitions is the coupling among the components and the systems organization resulting from such coupling. The application of the above concept by the use of a term known, in system thinking, as "anasynthesis", specifically defined as the process of analysis, synthesis modeling and simulation.

"In simple terms, a systems approach means doing something intelligently, effectively and humanely." (Cohen, S.A.)

Use of Models:

From the standpoint of this Program and to development of an empirical curriculum in basic skills, the concept and use of models is critical.

A model is defined as less pretentious than a theory and implies a somewhat shorter life span. Yet, a model exhibits all the logical empirical characteristics of a theory. A model is used to:

- . Describe and help us understand complex systems
- . Help us see relationships
- . Provide the framework for experimentation
- . Indicate areas in which experimentation is possible
- . Indicate areas in which experimentation is not possible
- . Assist in engineering design

A Definition of Applied Model:

Applied research has different requirements than basic research. Applied research emphasizes outcomes versus conceptual analysis; clinical significance versus conceptual analysis; clinical significance versus response simplicity; situational complexity versus stimulus and laboratory simplicity; population heterogeneity versus subject homogeneity; a systems approach versus single variables; individual preferences and needs versus objective apparatus measures; practicality and cost benefits versus statistical significance; and side effects versus central tendency. Further, by the use of the applied model concept the school researcher attempts to deliver, in a systematic way, research data and findings from the most important laboratory and field research studies available. Such findings should have the greatest implication for enabling the school researcher to further "unpack and sort out" the complex interacting variables found in the learning process at the school and classroom level. By this approach the applied model then becomes:

- . A taxonomy for organizing related skills, assessment techniques, management systems, materials, teaching staff and evaluation models systematically.

. A tool for organizing and developing an empirical curriculum design based on researcher-teacher-student interaction and empirical data.

. The reiteration system which automatically becomes a critical management tool: by the feedback of data and findings into the instructional systems that validate the empirical systems and act to redesign the curriculum based upon criterion assessment data.

. Further, this portion of the applied model leads to new lines of research, improved evaluation design that leads to further insights and new findings that unlock, still further, the complexities related to the learning of basic skills in learning and reading or any other curriculum area in a school.

Based upon the above theoretical concepts, we organized an integrated-Informational Processing Model (IPM) which acts as the major construct for the entire implementation process upon which the program is based. (See Appendix A) This model has all the aspects of a systems approach referred to above. It is an empirically-based heuristic model designed to "unpack" the complexities of the "educational" process in elementary education. The Informational Processing Model also acts as a management delivery system, designed to generate an instructional system for children from pre-school through the fourth grade. 99, 104

The Model (IPM) has two major integrated components (See Appendix A)

1) The Macro System: A basis for learning and development.

. Relies heavily on knowledge and research in cybernetics communication theory, neuropsychology and neurophysiology. It is a synthesis of the work of Osgood, Wepman, Kirk, Myklebust, Clements, Pribram, Bruner, Piaget, Vygotsky.

. The Applied System Science Construct acts as the basis of the management system and comes from the works of Von Bertalanffy, Buckley, Corrigan, Tuckman,

The applied vehicle for the above theoretical constructs is developed in the second component of the Informational Processing Model.

2) The Micro System:

. It is used as a taxonomy for organizing a diagnostic prescriptive instructional process based on diagnostic assessment data for each student entering kindergarten. This assessment is organized around three major human development constructs:

- . Motor systems
- . Perceptual Systems
- . Language Cognitive Systems

Methods and Techniques

The various components on instruction are organized within the Micro System. The IPM is used as a taxonomy for organizing a diagnostic-prescriptive instructional process based on the diagnostic basic skills needs of the students in the Project. (See Appendix A). The following sub-systems are:

1) Diagnostic and Assessment Instruments Used to Obtain a Profile of each Child's Developmental Level.

- . Peabody Picture Vocabulary Test
- . Two subtests of the ITPA Experimental Version
 - . Auditory vocal automatic
 - . Auditory vocal association
- . Berry Visual Motor Integration Test
- . Lorge Thorndike Intelligence Test Form A-Level I-II Non Verbal
- . Gates Reading Readiness Test
- . Metropolitan Achievement Test (District Testing Program)

Those tests requiring individual testing procedures such as PPVT, two subtests of the ITPA, Berry Visual Motor Integration Test, were administered by a team of experienced teachers who were trained to use these instruments by the Project Director, who is a psychologist.

The group tests were given by each classroom teacher assigned to the Project. These were the Large Thorndike IQ-Form A, Level I-II Non Verbal battery, Gates Reading Readiness Test, Metropolitan Achievement Test. Each teacher was assisted by other experienced classroom teachers and a para-professional.

The data from this assessment process was used to develop an individual learning and readiness profile for each of the 436 kindergarten students in the Project. The data also provided a pre-post model for the instructional intervention over nine months of instruction. On the individual profiles the pre-post data is treated as each criterion level progress rather than as achievement test data. This data is also used to form the necessary groups in the readiness model.

Readiness for learning in the IPM implies that there are certain conditions that precede the learning event itself and they operate to determine the probability of its occurrence. More specifically there is an identifiable category of language, perceptual and cognitive "abilities" that appear less specific and are the more global behaviors underlying reading and writing. These "abilities" factors do not imply inherited potential. As this and dozens of other studies demonstrate, these variables, as tested on the instruments used in this program, can be learned and therefore can also be taught.

Using the Informational Processing Model construct we designed the learning readiness curriculum that systematically teaches each child those decoding skills which research indicates to be the most crucial to the conditions which precede the

formal school-presented learning tasks which are:

- .Attention
- .Gross and Fine Motor Process: Tactile-Kinesthetic
- .Visual Perception
- .Auditory Perception
- .Auditory Language Analysis
- .Cognitive Skills: Short Term Visual and Auditory Memory;
- .Verbal Reasoning and Strategy Building via Language Symbolic Formations

Within the systems technology used within the model we organized:

- .Teachers
- .Para-professionals
- .Mastery Learning Strategies
- .Special Materials and Learning Packages
- .Time Space
- .Scheduling of Inputs
- .Use of building space outside of the classroom
- .Room dividers
- .Classroom floor plans
- .Small Group Learning based on functional level of students in the Distar Reading System
- .Intensity of Learning induced by:
 - .Time Scheduling
 - .Sequencing* of Learning Packages
 - .Tight structuring of time, space, materials and personnel
 - .Criterion and Process Evaluation based on an evaluation design

- . Student progress records of basic skills development
- . Process "mastery checks" used as formative test of basic skills learning for all areas of the Informational Processing Model
- . Management evaluation check list
- . Management decisions from data
- . Problem solving process
- . Teacher Workshops
- . Distar Training Sessions
- . Daily noontime meetings conducted on a systematic schedule over entire school year

In conjunction with the readiness model we then organized an integrated and systematic reading system based on knowledge found in the reading research literature over the past ten years.

Position Statement on Reading Based on Reading Research

There are some excellent leads for curriculum design to be found in this reading research literature. Much of this research has moved away from concerns over methods of teaching reading to areas related to:

- . Language development
- . Learning to read
- . The role of models
- . Systematic effort in model and systems development as related to instruction
- . Application of convergence techniques in the solution of reading problems

We have found that there are five major models related to the process of reading and which act as the foundation for many reading systems in use today. It is these five models which are directly associated with the Informational Processing Model and

the High Intensity Learning System - Reading used as the basis of the curriculum design from kindergarten through fourth grade. These models are:

- .Linguistic
- .Psycholinguistic
- .Information Processing
- .Cognitive Processes
- .Perception

The current trend among reading researchers is their attempt to unlock the complexity of the reading process by using a convergence technique among divergent models.

Some of the generalizations which emerge, by using the convergence technique with the various divergent models in use today, that apply to the conceptual constructs of the Information Processing Model are:

.The need to reduce uncertainty:

From birth on, an organism needs to reduce uncertainty or to gain information. Reading, like any other process tends to reduce uncertainty by processing information. This is a basic motivation for learning to read.

.Internal representations:

The organism internalizes a representation called a schema by Bartlett (1932) and Pribram (1960). This means that an organism is developing a hierarchy that controls the order in which a sequence of operations takes place.

. Early and rapid development of language:

There is general agreement that a child's ability to use the more common grammatical patterns of speech is fairly well developed by the time he is three to three and one half years old.

.Role of Cognition:

It has altered or led to a different understanding of our orthographic system, which is not a "one sound, one symbol system" but has characteristics more in keeping with Chomsky's levels of lexical abstractions and a deep structure rule of learning.

Speaking and Reading

A person's identification of words depends on "a three-way synthesis between certain sounds both that he makes and those that others make, feedback from his speech motor system and meaning". At the reading level, "there is again, a three-way synthesis between the spatial signs, the spoken word and meaning". Again, there is a parallel processing of input, this time visual, followed by the sequential verbal processing.

In some of the rapprochement among models in the current research that fits the Information Processing Model used as the basis of the reading curriculum is the concern of model builders with:

- .Attentional processes
- .Learning distinctive features of visual stimuli (matching input with a memory trace)
- .Visual information storage
- .Short-term memory
- .Long term memory
- .Coding process
- .The grammar of the language
- .Production strategies

The reading program which follows for kindergarten, first and second grades attempts to integrate some of the specific points outlined in the current reading research literature and those within the curriculum materials used in the various

subsystems of the Informational Processing Model.

We are not locked or tied to any specific reading system. At the current level of curriculum development, the Distar Reading System seems to be the best organized decoding system for teaching decoding skills, to children who are experiencing difficulty with school based language systems. Distar Reading seems to meet the specific empirical needs of this population of children. It also fulfills one of the basic tenets of the Informational Processing Model: that "decoding or input precedes output".

Reading is, initially, a receptive language skill which is learned. Because reading is a language process, it is the considered position of the Project staff that reading, initially, is a decoding process: input must precede output. To meet the instructional demands indicated by the empirically based needs, demonstrated by a large percentage of urban pupils for decoding skills, and also because the entire readiness-for-learning Information Processing Curriculum is based on a decoding model, Distar I, II, III was selected as the reading program. The Distar Reading Systems I, II, III has empirically demonstrated that all children can master the integrated language skills associated with decoding.

The Readiness for Learning and the Distar Reading Systems I, II, III are systematically linked with the High Intensity Learning System-Reading designed by Dr. S. Alan Cohen. The High Intensity Learning System is a classroom management system built around six features:

- . Prescriptive - Teacher defines student's unique needs and prescribes activities to meet those needs
- . Motivating - Pupil gets immediate feedback to his responses
- . Individualized - A variety of materials are used that are designed specifically

to assist the teacher in personalizing content, rate and level for each student.

. Intensified - Its objective is accountability for each student and teacher.

. Both know what must be learned.

. Both know methods and materials to use.

. Both know what must be done to show mastery.

. Definitive - The system is used in a reading center where High Intensity Learning maximizes the amount of "reading period" time the student spends on appropriate learning activities.

. An "Open System." - The system is continuously being reviewed and improved.

It is not partial to any single program or publisher. This instructional system is designed to increase actual clock time spent by each pupil per class hour in participating in the prescribed learning activity. Research reports that the average teacher receives only 30-40 per cent of the pupil's attention, fixed on the learning task, per class hour. That same research reports the obvious: The single, most important, variable that best predicts reading achievement is the actual amount of time the pupil spends learning to read and write. The more time he spends, all other factors being equal, the higher will be the achievement.

All the second grade students, in addition to their classroom exposure to the Readiness for Learning program as described above, and to the Distar Reading System, were scheduled for forty-five minutes each day, to attend a HILS-Center, set up in a separate centralized classroom, conveniently located to all the Project classrooms, in six different schools. (See Appendix B).

In the last Project year, we continued to improve the Reading process model by a concept of "total reading". All second grade classroom teachers in Right to Read schools were using the Distar Reading System I, II, III. All students at this

level attend a HHS-Reading Center for forty-five minutes each day. The classroom teachers, even with all this student reading exposure, were of the opinion they needed to work more intensively with their students on those skills diagnosed in the HHS-Reading Centers.

We then installed, in all the Right to Read schools, the Wisconsin Design Reading Skills Program. We assessed all pupils on the Wisconsin Assessment Instruments and developed profiles for each student, at all levels, from kindergarten through third grade. In conjunction with this assessment procedure, we began to develop intensively, a central teacher material file to code to all the word decoding skills in the Wisconsin Design.

At the same time we began to train two third grade teachers in the use of the Croft System for Comprehension Skills. This is a system similar to the Wisconsin design but it deals with a taxonomy of structured comprehension skills.

The Croft System is a diagnostic prescriptive approach with specific skill arrays. It provides materials coded to each skill area.

A team of eight teachers began to code materials, selected from many sources, to the instructional objectives of the Croft system of Comprehension, as they were doing with the Wisconsin Design.

We then organized, for the first time, an "individual student profile" to be used as a continuous record of skill mastery in "word analysis" and comprehension skills. This was to be a permanent record to follow the student from the kindergarten through the third grade.

At the same time we developed a visual accountability system. This is a set of wall charts for each classroom which indicates exactly what skills the student has mastered and what skills still need work, in word study and comprehension skills, as defined in the Wisconsin Design and the Croft System of Comprehension.

Skills.

At this point the development of the Informational Processing Model-Instructional Process Curriculum was interrupted by a drastic cut in Government and Board of Education financial support. The Project Director and all the extra staff were disbanded and sent elsewhere because of financial constraints in the district. Much of the work continues but the momentum and ongoing development has ceased.

RESULTS AND CONCLUSIONS

Results

The following summary is what the data indicates about pupil performance and the effects the readiness-for-learning and reading curriculum has on various groups of students receiving treatment in the program. This data is from the evaluation report submitted by Dr. S. Alan Cohen for the end of the second project year, i. e., end of first grade. It should also be mentioned that the basic quasi-research design of the Title III-306 Program is longitudinal in nature. Children who remain in each school have received the educational treatment provided by the curriculum for a period of three years, starting with kindergarten through and including second grade. For anyone interested in the statistical data there are complete computer print-outs on all data coded to all the significant tables in the final report. These records are open to any who might be interested. The following statistical operations are coded for computer analysis which consists of:

- . Analyses of variance to test differences in means.
- . Pearson Product moment correlations.
- . Point Bi-serial correlations.
- . Multiple correlations were run on all the appropriate data, including pre-post gain scores.
- . Regression coefficients were drawn allowing the evaluator to designate the exact amounts of gain or loss in original raw score units (grade, age, days absent, etc.) of the independent variables that could account for the gain or loss in the dependent variable. (For more detail see Dr. Cohen's Final Report:End of Second Project Year). The data analysis was organized by Dr. Cohen for presentation to the computer and for the formulation into tables. In order for the reader to understand how

the data is organized by Dr. Cohen, it is necessary to present the model he used.

Dr. Cohen designated the:

- . Peabody Picture Vocabulary Test (PPVT)
- . Illinois Tests of Psycholinguistic Abilities (ITPA-2) subtests were used.
Grammar and the Association subtest (Experimental Version)
- . Large Thorndike Intelligence Test: Level I - Form A

As an identifiable category of language and cognition, "ability" tests as distinct from the reading and perceptive-motor categories, Dr. Cohen further states, "abilities do not imply inherited potential. As this and dozens of other studies demonstrate, the variables tested on these instruments are able to be learned and, therefore, able to be taught. These "abilities" appear less specific and are the more global behaviors underlying reading and writing. They were analyzed as those behaviors that lurk just behind the obvious reading behaviors tapped on the Wide Range and Metropolitan Achievement Test".*

Analysis of Reading Test Scores:

- . Wide Range Achievement Test
- . Metropolitan Reading Test
 - . Word Knowledge
 - . Word Discrimination
 - . Reading - Comprehension

The basic evaluation design was post-test analysis using national norms as the comparison criterion.

The tests were given at grade one (actually at grade 1.7). Two basic forms of data were used: the grade level score and the percent of students above grade level.

*Final Evaluation Title III - 306 End of Second Project Year-Evaluator, Dr. S. Alan Cohen. A copy of Dr. Cohen's report can be obtained from Mr. Robert D. Adams, Newark Board of Education, Newark, N. J.

Summary of Results End of Second Project Year

. The students who had a previous year of program in kindergarten, in seven months of instruction in grade 1, made:

- . On the PPVT, about 8-1/2 months' growth
- . On ITPA Grammar subtest, about 15 months' growth
- . On ITPA Association, about 15 months' growth
- . On the Lorge Thorndike, about four (4) IQ points to 98 IQ

. At the end of grade I, the Title III-306 students, as a whole, were still 30 months below norms on PPVT, 17 months below norms on ITPA-Gram, 6 months below norms on ITPA Assoc. and 3 IQ points below the magic 100.

. The boys did slightly better than the girls on all the ability tests. Those Title III-306 first graders who had a previous year of Title III kindergarten did from two to seven months better than the students who had no Title III Kindergarten on PPVT and ITPA. They also got 6 IQ points more as well.

. Neither absences nor age influenced gains on PPVT, ITPA or Lorge Thorndike.

. As a whole, the students exceeded grade level on the Metropolitan Reading Tests, but just missed grade level on the WRAT.

. The second year in Title III-306 students did three to four months better in reading than the first-year Title III-306 students.

. Twenty to 28 per cent more second year Title III-306 students exceeded grade level in reading than did first year Title III-306 students.

. Avon Avenue School students did consistently better on the reading post-tests than the other three schools' students.

. The girls did slightly better than the boys in reading.

. Absences influenced reading scores. Ten absences equals a 40 per cent to a full month's loss in reading score.

. Jumping, Body I.D., Wepman and Beery improved significantly.

. Boys gained more on the Purdue Backward, while girls gained more on Jumping.

. The students who were in Title III-306 kindergarten a year ago did better on the Wepman than did children new to the treatment.

. Absence had no influence on perceptuo-motor performance.

. The Wepman has very little to do with reading, but seems to be related to PPVT performance.

. The Beery is highly related to all four reading tests.

. But all the movigenics tests have no relationship to learning, language, and reading abilities tests in this study.

Conclusions:

The following conclusions are from Dr. S. Alan Cohen's final evaluation report at the end of the second Project Year:

. The data shows that by all reasonable criteria the Title III-306 Project was dramatically successful. The pupils who have two years of program treatment showed gains greater than what normal middle class children ordinarily make on most of the reading and ability tests.

. There is no question that children benefited far more after two years with the program than after one year. (This is viable reason for institutionalizing the curriculum at kindergarten and first grade. The results are empirically validated.)

. Even with the dramatic gains shown in the "abilities" skills profile of project population, the educational deficits on those evaluation instruments requiring language skills remain significantly low. Continued programmatic treatment is recommended at least for another year in order to permit a larger number of pupils to master these critical decoding language skills tapped by the PPVT and the ITPA.

. The program had a marked effect on reading achievement, especially on those pupils who had attended the Title III-306 kindergarten the previous year. Fifty to sixty per cent of the second year Title III-306 students scored above the national norms compared to twenty-two to thirty-nine per cent of the first year Title III-306 students.

. The data also shows that the Distar Reading System does not produce significant gains in reading comprehension as it does in word attack skills as measured by the Word Knowledge and Word Discrimination subtest of the Metropolitan Reading Test.

. The Distar Reading System does enable pupils to learn to decode early in their school life and it also enables them to experience success in learning the code of the graphic symbol system. It also seems to meet the assessed language needs of all the pupils in the program, because it is sequential, structured, based on a success model, and the system permits pupils to move at their own rate without the pressure of competing with pupils who learn at a faster rate.

. The Distar Reading System is also geared to "mastery learning concept". The child only moves to a higher order skill after he has met a fixed criterion of skills learned at a lower level.

. School environments do seem to make a difference on the reading achievement of pupils. Avon Avenue and 14th Avenue showed consistently higher reading achievement scores compared to Harriet Tubman and 18th Avenue Schools.

. Once again, the variable of sex difference indicates that girls on all three tests of the MAT outperform the boys. But we continue to teach as if boys and girls both learned to read at the same rate, when this does not seem to be the case.

. Absence influenced reading achievement on the post-test reading performance from 2/5 to a full month's achievement for every 10 absences.

. Attending the Title III-306 kindergarten did have substantial influence on the Wepman Auditory discrimination of word pairs.

. The data also shows that the lack of correlation between the group of skills termed perceptive motor by Dr. Cohen, and measured on the Roach-Kephart Motor Performance Scale and Beery Visual Motor Integration test, do not contribute to the learning abilities of this population. The correlations between perceptive-motor tests and the "abilities" test-PPVT, ITPA and Lorge Thorndike IQ hover around the zero correlation figure.

These are additional conclusions that can be drawn from the data:

. There are several important findings provided by the data that should have significant effect on curriculum design and administrative direction, if we are to find the solution to learning and reading failure of pupils.

We can predict, with a high degree of probability, who the reading and learning high risk pupil will be at the end of the second grade. We can do this very successfully at the end of kindergarten. Why do we wait, as we do now, until the end of third grade?

. There are several significant skills areas which still do not respond rapidly enough to treatment. These are:

- . Attending to critical cues.
- . Difficulty of following directions presented verbally.
- . Difficulty with auditory processing of three level commands.
- . Short term memory.
- . Blending: spelling words by sound.
- . Reading comprehension skills as measured on the MAT.

The following conclusions relate to the management and process objective of the Project:

. The concept of a systems approach as a management tool, using an Informational Processing Model, is an excellent means of delivering services and of organizing learning environments and personnel to achieve change in an elementary school.

. The use of an evaluation design is an efficient way to obtain process information about classroom learning environments and is an excellent way of obtaining data about these environments in order to improve them.

. There is one dramatic fact that can be concluded from the data and organization obtained from the system used in the Title III-306 Project. We can bring about significant change in the performance of urban pupils. They can learn! Of this there is no doubt! The most difficult and obvious fact, however, is that we seem to be totally unable to "sustain change" in schools, even when it is empirically supported by data, political backing and professional consent.

RECOMMENDATIONS

Although the recommendations that follow may appear to be obvious and self-evident to many who read them, putting them into operation is a difficult and challenging task. To carry out successfully all the attached recommendations would require a body of trained and dedicated administrators, teachers, ancillary personnel equipped with the spirit of change. What is needed is leadership that is willing to risk; leadership that will develop the energy level required to inaugurate and sustain change by developing a professional climate that rewards the risk takers who have the knowledge and willingness to innovate; leaders who will support such professionals when the "fire fights" to resistance develop.

The following recommendations can all be inaugurated:

1) Starting with kindergarten, all learning processes to language, reading and arithmetic development be organized on the basis of a systems approach, utilizing a management by objectives technique.

2) All learning and instruction at all levels of elementary education (K-8) should be organized on the basis of a diagnostic-prescriptive process using a taxonomy of skills, instructional objectives, pre-post criterion testing organized around either individual or group learning patterns of the pupils.

3) It is imperative that a permanent "skills inventory" record be established for each pupil entering the educational process. This skills profile is to be a permanent record that follows each student as he proceeds through the grades.

4) Every incoming student should be assessed in order to establish what "skills" he has and what "skills" require educational development in the areas of learning readiness, learning to read (decoding) and arithmetic. The purpose of obtaining this data is to develop an adequate diagnostic-prescriptive educational

program for every child in the first four grades of elementary education.

5) Each classroom learning environment should be organized to efficiently utilize a "learning centers" technology, in conjunction with skills taxonomy, coded to instructional objectives, pre-post criterion tests, student skills profiles and diagnostic-prescriptive instruction facilitated by the teacher.

6) In order to assure that the preceding recommended technology works for children, teachers must be encouraged to keep detailed performance records of each pupil's strengths and weaknesses in the skills areas.

7) Criterion performance test results should be consistently reviewed so that the teacher, as the educational facilitator can know exactly where pupils under her direction stand in relation to the mastery of all skills needs as diagnosed for each child.

8) A process report for each learning environment should be required of each teacher facilitator three times a year, i.e., November, March and June. This report would define in criterion terms what percentage of their pupils were meeting the criteria set for all elementary levels, including pre-school.

9) The criterion percentage of skills attained for each level would be determined empirically after the system was established. To start, we would expect children to attain 80% criterion level.

10) In conjunction with the above process evaluation system, it will also be necessary to develop an immediate method for organizing process evaluation for each school, so that those learning environments which are not meeting the criteria in any school will receive immediate assistance from the principal, supervisors, helping teachers and other ancillary personnel.

11) The major key to the successful implementation of the above recommendations is the development of an intensified on-the-job training program. This program must be organized around the systems science concepts: management by objectives, diagnostic-prescriptive teaching, learning centers, skills taxonomies, criterion testing, pupil recordkeeping relative to skills profiles, materials and media technology, problem solving and mastery learning vs. normative learning patterns (See Bloom, Block, Carroll, Gagne¹ and Cohen).

12) In order to solve the reading and learning problems in urban centers, the nature and complexity of the reading process must be better understood by the professional staff. The futile search for a "one" magic reading method and numbers game using the M.A.T.G.E. scores, must go. The myopic refusal by large numbers of teachers (not all) and administrators, to define the problem, and their delay in implementing more appropriate empirically based curriculum and new "soft ware" technologies, which better fit the needs of the student population must be corrected. Without such a "shift in attitude" the present endemic learning and educational failure will continue.

13) There is also a very urgent need for more direct supervision of the teaching-learning process by professional administrators and curriculum specialists who are not intimidated by confrontation, who will risk, act as change agents and actively search for a solution to the reading and learning problems in the schools, not just go through the motions.

14) There is an urgent need for the development and training of a "new breed" of educational researcher whose goals, reward system, norms, value system and ideology will be patterned based on "in school" research needs. This kind of researcher should not try to emulate the academic and laboratory researcher who

does research "on schools". The major aim of "in school" applied researchers should be to develop research models "in schools" that are designed to empirically validate the research findings of the out-of-school research community. At the same time to develop new heuristic theories and models from what will arise as he systematically attempts to apply the findings from the "on school" research literature. A major goal of the applied researcher is to be in to build a body of empirical research findings developed "in schools" that will have the same "power" to inform social policy decision making as the academic and laboratory researcher now enjoys. Further, research developed "in schools" will increase the probability of a better match between "what is" to "what ought to be" and to improve the decision making process at all levels of the bureaucracy.

15) It is imperative that "in school" educational researchers, if they are to reach their professional goal, fully understand the effect of the "informal social structure of the schools (Ianni, Bakker, et al) and the politics of education (Mann). He must study these systems scientifically using ethnologies, participant observation, anthropological field study techniques, if he is to succeed in schools.

16) It is also very important that applied researchers "in schools" do extended and in-depth research at the classroom level using ethnologies, participant observation and field study techniques as used in anthropology, in order to begin to formulate an empirical data base for the development of a "ground theory" (Bakker, Ianni) about what happens in the classroom between teacher and learner.

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